

PATENT COOPERATION TREATY

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INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY



(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

REC'D 11 OCT 2005

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Applicant's or agent's file reference 58913WO002	FOR FURTHER ACTION		See Form PCT/PEA/416
International application No. PCT/US2004/005273	International filing date (day/month/year) 23.02.2004	Priority date (day/month/year) 16.07.2003	
International Patent Classification (IPC) or national classification and IPC G02B5/28, B32B17/10			
Applicant 3M INNOVATIVE PROPERTIES COMPANY et al.			
<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 7 sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input checked="" type="checkbox"/> sent to the applicant and to the International Bureau a total of 5 sheets, as follows:</p> <p><input checked="" type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in Item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (sent to the International Bureau only) a total of (Indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p>			
<p>4. This report contains indications relating to the following items:</p> <p><input checked="" type="checkbox"/> Box No. I Basis of the opinion</p> <p><input type="checkbox"/> Box No. II Priority</p> <p><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p><input type="checkbox"/> Box No. IV Lack of unity of invention</p> <p><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p><input type="checkbox"/> Box No. VI Certain documents cited</p> <p><input checked="" type="checkbox"/> Box No. VII Certain defects in the international application</p> <p><input type="checkbox"/> Box No. VIII Certain observations on the international application</p>			
Date of submission of the demand 28.04.2005		Date of completion of this report 10.10.2005	
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465		Authorized Officer Hornung, A Telephone No. +49 89 2399-2595 	

**INTERNATIONAL PRELIMINARY REPORT
ON PATENTABILITY**

International application No.
PCT/US2004/005273

Box No. I Basis of the report

1. With regard to the **language**, this report is based on the International application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ This report is based on translations from the original language into the following language , which is the language of a translation furnished for the purposes of:
- ☐ International search (under Rules 12.3 and 23.1(b))
 - ☐ publication of the International application (under Rule 12.4)
 - ☐ International preliminary examination (under Rules 55.2 and/or 55.3)
2. With regard to the **elements*** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

Description, Pages

1-23 as originally filed

Claims, Numbers

1-30 filed with telefax on 28.04.2005

Drawings, Sheets

1/3-3/3 as originally filed

- ☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing

3. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages
- ☐ the claims, Nos.
- ☐ the drawings, sheets/figs
- ☐ the sequence listing (*specify*):
- ☐ any table(s) related to sequence listing (*specify*):

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

- ☐ the description, pages
- ☐ the claims, Nos.
- ☐ the drawings, sheets/figs
- ☐ the sequence listing (*specify*):
- ☐ any table(s) related to sequence listing (*specify*):

* If item 4 applies, some or all of these sheets may be marked "superseded."

**INTERNATIONAL PRELIMINARY REPORT
ON PATENTABILITY**

International application No.
PCT/US2004/005273

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	2-20,22-30
	No: Claims	1,21
Inventive step (IS)	Yes: Claims	
	No: Claims	1-30
Industrial applicability (IA)	Yes: Claims	1-30
	No: Claims	

2. Citations and explanations (Rule 70.7):

see separate sheet

Box No. VII Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

see separate sheet

Re Item V

**Reasoned statement with regard to novelty, inventive step or industrial applicability;
citations and explanations supporting such statement**

1. Reference is made to the following documents:

D1: WO01/23915

2. The present application does not meet the requirements of Article 6 PCT because claims 1, 4-12, 14 and 17 are not clear. Further objections under Article 6 PCT are raised concerning the description.

2.1. The feature of claim 1 "multiple layers are fused" relates to a method of manufacturing the claimed optical sheet rather than clearly defining the sheet in terms of its technical features. The intended limitations are therefore not clear from this claim, contrary to the requirements of Article 6 PCT.

2.2. The claimed result is defined in claim 1 by using vague terms so that the exact extent of the claim remains obscure: "... so as to *at least substantially reduce* delamination".

2.3. The feature in claim 1 concerning the origin of the delamination, i.e. "... where the delamination is caused, at least in part, by stresses placed on said optical film during glazing lamination processing.", does not induce a limitation of the claimed subject-matter.

2.4. The functional feature "... for use in a laminate comprising at least one glazing component..." used in claim 1 for specifying a functionality of the claimed optical sheet does not allow to clearly identify the technical features of the optical sheet. Actually, any optical sheet is physically suitable to be used in a glazing laminate. Moreover, the term "glazing" per se may be interpreted in a large manner to include a lot of different substrates, e.g. perfectly transparent optical glass, diffusing and/or absorbing glass or plastic.

Moreover, the definition of the claimed optical sheet is unclear because claim 1 refers to a glazing which does not belong to the claimed subject-matter. A similar objection is valid for all other claims referring to a glazing component (e.g. claims 4-12).

2.5. Claim 1 is unclear since it defines the optical sheet by means of a "disclaimer", instead of defining it with the help of positive features: "a non-metallic multi-layer optical film".

Moreover, the use of this disclaimer in combination with the wording of claim 1 "... said optical sheet comprising a non-metallic multi-layer optical film..." generates doubt concerning the presence or not of a metallic layer in the optical sheet. Actually, the term "non-metallic" seems to imply that no metallic layer at all is present in the sheet, yet the term "comprising" would allow for a metallic layer in the sheet.

2.6. Despite it is clear that "extensive" means "covering a large area" and that "co-" is a prefix meaning "joint" or "mutual", the limitation which is intended by the use of the term "co-extensive" is unclear in any claim using this term (see for instance claims 6, 7, 9-12).

2.7. Claim 12 seems to be contradictory with claims 6 or 8 on which it depends. Actually, the optical film in claim 12 extends beyond both glazing components, whereas it is also "co-extensive" with at least one glazing component.

2.8. Claim 14 is a use claim.

2.9. Claim 17 is unclear since it defines the laminate by means of a "disclaimer", instead of defining it with the help of positive features: "the optical film is not encapsulated".

2.10. It is not clear which features essential to the present application are meant to be specified by the expression on page 20, line 19: "all of which are incorporated herein by reference in their entirety." The same objection is valid for the document mentioned on page 22, line 17.

2.11. The vague and imprecise statement in the description on page 23, last paragraph, implies that the subject-matter for which protection is sought may be different to that defined by the claims, thereby resulting in lack of clarity of the claims. Moreover, none of the mentioned "various modifications" is effectively described in this paragraph. This paragraph should therefore be deleted.

3. Novelty and inventive step.

Insofar as the claims can be understood (see § 2.), the subject-matter of claims 1-30 is not new in the sense of Article 33 (2) PCT and/or does not comprise an inventive step in the sense of Article 33 (3) PCT.

3.1. D1 discloses an optical sheet comprising:

* a non-metallic multi-layer optical film (page 1, first paragraph),

* wherein the multiple layers are fused together so as to reduce delamination (page 5, second paragraph).

Furthermore, the optical sheet of D1 is suitable for use in a laminate comprising a glazing component (see for instance page 11, third paragraph).

Hence, the subject-matter of claim 1 is anticipated by D1.

3.2. Moreover, the optical sheet of D1 is sandwiched between two glazing substrates (page 4, fifth paragraph). Each of the glazing substrates consists of several individual layers, wherein the individual layer being closest to the optical sheet can be considered as being a "bonding sheet" (page 4, sixth paragraph). Finally, since the optical sheet consists of piled layers which are combined with the glazing substrates into a window for an automobile or a building, D1 discloses implicitly that the optical sheet is dimensioned so as to be substantially co-extensive with a corresponding glazing component.

Hence, the subject-matter of the independent method claim 21 is also anticipated by D1.

3.3. Dependent claims 2-20 and 21-30 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of novelty and/or inventive step. See the documents and passages mentioned in the search report. In particular, several dependent claims are directed to various combinations of positioning and dimensioning of the optical sheet, bonding sheet and glazing component. However, these combinations are considered being obvious possibilities when the skilled person is designing a glazing laminate for a window and confronted with the problem of delamination.

Re Item VII

Certain defects in the international application

Reference signs in parentheses are not inserted in the claims (Rule 6.2 (b) PCT).

The document D1 is not identified and discussed in the description (Rule 5.1 (a) (ii) PCT).

The independent claims 1 and 21 are not drafted in the two-part form with reference to D1 (Rule 6.3 (b) PCT).

The unit of temperature employed on page 15, lines 30-31 is not additionally expressed in terms of the units stipulated by Rule 10.1/(a)/and/(b) PCT.

Figures 3 and 4 of the present application do not seem to comply with the requirement of Rule 11.13(a) PCT in that specific fusing zones as described on page 16, lines 7-19 cannot be recognized.

What is claimed is:

1. An optical sheet suitable for use in a laminate comprising at least one glazing component having a peripheral edge, said optical sheet comprising a non-metallic multi-layer optical film, said optical film having multiple layers and a peripheral edge, and said multiple layers are fused together along a substantial portion of the peripheral edge of said optical film so as to at least substantially reduce delamination of said multiple layers along at least said substantial portion of the peripheral edge of said optical film, where the delamination is caused, at least in part, by stresses placed on said optical film during glazing lamination processing.

2. The optical sheet according to claim 1, wherein said multiple layers are fused together along all of the peripheral edge of said optical film so as to at least substantially reduce delamination of said multiple layers along substantially all of the peripheral edge of said optical film.

3. The optical sheet according to claim 1, wherein said multiple layers are at least thermally fused together along at least said substantial portion of the peripheral edge of said optical film.

4. A laminate comprising the optical sheet according to any one of claims 1 to 3, with said optical sheet having a major surface and a peripheral edge, and a first bonding sheet having a major surface and a peripheral edge, said first bonding sheet being suitable for bonding to a glazing component having a major surface and a peripheral edge and to said optical sheet, and the major surface of said optical sheet and the major surface of said first bonding sheet being positioned together.

5. The laminate according to claim 4, wherein said optical sheet has another major surface and said laminate further comprises a second bonding sheet having a major surface and a peripheral edge, the major surface of said second bonding sheet being positioned relative to the other major surface of said optical sheet such that said optical sheet is disposed between said first bonding sheet and said second bonding sheet, and said second bonding sheet being suitable for bonding to the major surface of another glazing component.

6. The laminate according to claim 5, wherein said laminate is a glazing laminate further comprising two glazing components, each of said glazing components having a major surface and a peripheral edge, wherein each of said first bonding sheet and said second bonding sheet has another major surface that faces the major surface of one or the other of said glazing components, said optical sheet is disposed between said first and second bonding sheets, said first and second bonding sheets are disposed between said glazing components, and at least said substantial portion of the peripheral edge of said optical film is positioned so as to be substantially co-extensive with a corresponding portion of the peripheral edge of at least one of said glazing components.

7. The laminate according to claim 6, wherein all of the peripheral edge of said optical film is positioned so as to be substantially co-extensive with the peripheral edge of at least one of said glazing components.

8. The laminate according to claim 6, wherein each of said first and second bonding sheets is fully bonded to said optical sheet and to its respective glazing component.

9. The laminate according to claim 6 or 8, wherein at least said substantial portion of the peripheral edge of said optical film is positioned so as to be substantially co-extensive with a corresponding portion of the peripheral edges of said glazing components.

10. The laminate according to claim 6 or 8, wherein at least said substantial portion of the peripheral edge of said optical film is positioned so as to be substantially co-extensive with a corresponding portion of the peripheral edge of at least one of said glazing components.

11. The laminate according to claim 6 or 8, wherein at least a remaining portion of the peripheral edge of said optical film is positioned so as to extend substantially beyond the peripheral edge of both of said bonding sheets, and the peripheral edge of each of said bonding sheets is substantially co-extensive with or lies substantially within the peripheral edge of both of said glazing components.

12. The laminate according to claim 6 or 8, wherein at least a substantial portion of the peripheral edge of said optical film is positioned so as to extend substantially beyond the peripheral edge of both of said bonding sheets, and the peripheral edge of each of said bonding sheets is substantially co-extensive with or lies substantially within the peripheral edge of both of said glazing components.

13. The laminate according to claim 8, wherein at least said substantial portion of the peripheral edge of said optical film is not encapsulated within bonding sheet material.

14. The laminate according to claim 8, wherein said laminate is a glazing suitable for use in a vehicle window.

15. The laminate according to claim 8, wherein said multiple layers along all of the peripheral edge of said optical film are fused together.

16. The laminate according to claim 9, wherein all of the peripheral edge of said optical film is positioned so as to be substantially co-extensive with the peripheral edge of both of said glazing components.

17. The laminate according to claim 15, wherein all of the peripheral edges of said optical film is not encapsulated within bonding sheet material.

18. The laminate according to any one of claims 4 to 17, wherein said substantial portion of the peripheral edge of said optical film is fused to a depth "d" of at least about 10 microns within said optical film from said peripheral edge.

19. The laminate according to any one of claims 4 to 18, wherein said multiple layers are fused together, along said substantial portion of the peripheral edge of said optical film, so as to be intermingled, while the remaining portion of said multiple layers remain relatively intact and co-planar.

20. The laminate according to any one of claims 4 to 19, wherein the remaining portion of said multiple layers, other than said substantial portion of the peripheral edge, is not fused so as to at least substantially reduce delamination of said multiple layers.

21. A method of making a glazing laminate for use in a window structure, the glazing laminate comprising an optical sheet sandwiched between two bonding sheets and the bonding sheets sandwiched between two glazing components, said method comprising:

providing an optical sheet comprising a non-metallic multi-layer optical film with multiple layers;

dimensioning the optical sheet so as to form a peripheral edge of the optical film; and

fusing together the multiple layers along a substantial portion of the peripheral edge of the optical film so as to at least substantially reduce delamination of the multiple layers along the substantial portion of the peripheral edge of the optical film, where the delamination is caused, at least in part, by stresses placed on said optical film during glazing lamination processing.

22. The method according to claim 21 further comprising:

providing two bonding sheets and two glazing components, with each of the bonding sheets being suitable for bonding to the optical sheet and to the glazing components;

sandwiching the optical sheet between the bonding sheets and the bonding sheets between the glazing components;

positioning the optical sheet so that at least the substantial portion of the peripheral edge of the optical film is positioned so as to be substantially co-extensive with a corresponding portion of the peripheral edge of at least one of the glazing components; and fully bonding the optical sheet, bonding sheets and glazing components together.

23. The method according to claim 22, wherein said dimensioning the optical sheet occurs before or after said sandwiching.

24. The method according to claim 21 or 22, wherein said fusing occurs after said dimensioning the optical sheet or simultaneously with said dimensioning the optical sheet.

25. The method according to claim 22, wherein said fusing occurs after said fully bonding.

26. The method according to claim 22, wherein said dimensioning the optical sheet occurs before said fully bonding.

27. The method according to claim 19, wherein said dimensioning the optical sheet further comprises dimensioning the optical sheet so that at least a remaining portion of the peripheral edge of the optical film is positioned so as to extend substantially beyond the peripheral edge of at least one of the glazing components, and said method further comprises dimensioning the bonding sheets so that the peripheral edge of each of the bonding sheets is substantially co-extensive with or lies substantially within the peripheral edge of both of the glazing components.

28. The laminate according to any one of claims 21 to 27, wherein said fusing occurs to a depth "d" of at least about 10 microns within the optical film from the peripheral edge.

29. The laminate according to any one of claims 21 to 28, wherein said multiple layers are fused together, along said substantial portion of the peripheral edge of said optical film, so as to be intermingled, while the remaining portion of said multiple layers remain relatively intact and co-planar.

30. The method according to any one of claims 21 to 29, wherein the remaining portion of the multiple layers, other than the substantial portion of the peripheral edge, is not fused so as to at least substantially reduce delamination of the multiple layers.